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09/761,532	01/16/2001	Satoshi Kawai	NAGAT9.001AUS	5867

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EXAMINER
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KIM, DAVID S

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 07/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/761,532

Applicant(s)

KAWAI ET AL.

Examiner

David S. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because:

In Fig. 5, "CHSHION" is used where – CUSHION – may be intended.

In Figs. 18-19, reference characters "61a," "61b," "61c," "63a," and "63b" are missing. See p. 32, l. 13-15.

In Fig. 14, reference characters "41" and "42" are missing from the specification.

In Fig. 15, reference characters "51" and "52" are missing from the specification.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

On p. 14, l. 23, "60 mm and 70 mm" is used where – 70 mm and 60 mm – may be intended. See Fig. 4.

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On p. 22, l. 14, "element 1" is used where – element 11 – may be intended. See. Fig. 9.

On p. 22, l. 31, "300 mm" is used where – 50 mm – may be intended.

On p. 24, l. 14, "duct" is used where – dust – may be intended.

In the abstract, line 12, "optical-signal" is used where – optical signal – may be intended.

Appropriate correction is required.

### ***Claim Objections***

3. **Claim 5** is objected to because of the following informalities:

The phrase, "either or both of upstream sections, extending in the emitter," is unclear.

In particular, "extending in the emitter" is not shown in the figures nor is it clear how upstream sections extend "in the emitter" of the figures. Also, antecedent basis for "both of upstream sections" is lacking.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claim 6** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 includes the following limitation:

*"such that a ratio between incident intensities of first and second optical signals, emitted from the emitter..., and then entering the receiver, is equal to or higher than a predetermined value at or above which a faulty optical signal transmission is not caused"* (emphasis Examiner's).

However, the corresponding specification reads:

*"If the incident level of optical signal to the light-receiving element 21 is equal to or higher than about 20% of the maximum incident intensity, no faulty transmission may be caused"* (emphasis Examiner's).

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Note that the claim language bases non-faulty optical signal transmission on a ratio between incident intensities of two signals from an emitter. On the other hand, the corresponding specification bases non-faulty optical signal transmission on a ratio between an actual incident intensity and a maximum incident intensity.

Claim 6: ratio            ~        incident intensity of a first optical signal  
   incident intensity of a second optical signal

specification: ratio       ~        actual incident intensity level  
   maximum incident intensity level

This difference in subject matter raises the issue of indefiniteness. That is, the specification presents a particular field of subject matter. Claim 6 delineates a scope of the invention that is not contained within this field of subject matter. Accordingly, this difference raises the question of whether or not claim 6 particularly points out and distinctly claims subject matter that the Applicant regards as his invention. Such a question renders claim 6 to be indefinite.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Maue et al.**

7. **Claims 1-10** are rejected under 35 U.S.C. 102(b) as being anticipated by Maue et al. (U.S. Patent No. 5,040,168).

**Regarding claim 1**, Maue et al. discloses:

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An optical signal transmission device, mounted to a vehicle, for propagating an optical signal, used to control operation of a vehicle-mounted apparatus, through a free space along a first propagation path (blocked path from transmitter 1A in Figs. 3 and 5 to modules 3 in Figs. 1-2 or to transmitter/sensor 1C or 1D in Fig. 5) extending from an emitter to a receiver and a second propagation path (unblocked path from transmitter 1A in Figs. 3 and 5 to modules 3 in Figs. 1-2 or to transmitter/sensors 1C or 1D in Fig. 5) extending from the emitter to the receiver via a reflector (col. 5, l. 35-66) that is disposed outside the emitter and the receiver, the improvement comprising:

an optical axis of a light-emitting element of the emitter or that of a light-receiving element of the receiver being deviated (emitter or receiver facing a reflector, i.e. a windshield in col. 5, l. 52-60) such that a ratio of an incident intensity, at the receiver, of a second optical signal propagating along the second propagation path (path of unblocked signal) to an incident intensity, at the receiver, of a first optical signal propagating along the first propagation path (path of blocked signal, col. 6, l. 15-19) is equal to or higher than a predetermined value (i.e. zero) at or above which a faulty optical-signal transmission is not caused.

**Regarding claim 2,** Maue et al. discloses:

The optical signal transmission device according to claim 1, wherein at least one of the light-emitting element of the emitter and the light-receiving element of the receiver is disposed upward (i.e. transmitter 1A facing a windshield in Fig. 5).

**Regarding claim 3,** Maue et al. discloses:

The optical signal transmission device according to claim 1, wherein said predetermined value is 25%.

Note an exemplary ratio of Maue et al.:

$$\text{ratio} \sim \frac{\text{unblocked signal}}{\text{blocked signal}} = \frac{X}{0}, X > 0 = \infty$$

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Note the ratio of claim 3:

$$\text{ratio} \sim 25\% = 1/4$$

The exemplary ratio of Maue et al. ( $\infty$ ) is higher than the predetermined value (25%) of claim 3.

**Regarding claim 4**, Maue et al. discloses:

The optical signal transmission device according to claim 1, wherein said light-emitting element is disposed that its optical axis (i.e. the axis of transmitter 1A facing a windshield in Fig. 5) coincides with an upstream section, extending from the emitter to the reflector, of the second propagation path (path of unblocked signal).

**Regarding claim 5**, Maue et al. discloses:

The optical signal transmission device according to claim 1, wherein one or more reflector members (plurality of reflecting surfaces in col. 5, l. 35-66) are disposed in either or both of upstream sections, extending in the emitter, of the first and second propagation paths.

**Regarding claim 6**, Maue et al. discloses:

An optical signal transmission device, mounted on a vehicle, for propagating an optical signal, used to control operation of a vehicle-mounted apparatus, through a free space from an emitter to a receiver, the improvement comprising:

said transmission device (Figs. 1-5) having a reflector (col. 5, l. 35-66) disposed outside the emitter (transmitter 1A in Figs. 3 and 5) and the receiver (modules 3 in Figs. 1-2 or transmitter/sensor 1C or 1D in Fig. 5) and formed with first and second slanted reflection planes (plurality of reflecting surfaces in col. 5, l. 35-66); and

said emitter including a light-emitting element having an optical axis (i.e. the axis of transmitter 1A facing a windshield in Fig. 5) thereof deviating from an imaginary line (line-of-sight between an emitter-and-receiver pair) connecting the emitter and the receiver toward the reflector such that a ratio between incident intensities of first (unblocked signal) and second

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(blocked signal, col. 6, l. 15-19) optical signals, emitted from the emitter, reflected individually by the first and second slanted reflection planes and then entering the receiver, is equal to or higher than a predetermined value (i.e. zero) at or above which a faulty optical signal transmission is not caused.

**Regarding claim 7,** Maue et al. discloses:

The optical signal transmission device according to claim 6, wherein said receiver includes a light-receiving element (modules 3 in Figs. 1-2 or to transmitter/sensors 1C or 1D in Fig. 5, col. 6, l. 10-14) for receiving the first and second optical signals, and at least one of the light-emitting element of the emitter and the light-receiving element of the receiver is disposed upward (i.e. transmitter 1A facing a windshield in Fig. 5).

**Regarding claim 8,** Maue et al. discloses:

The optical signal transmission device according to claim 6, wherein said predetermined value is 25%.

Note an exemplary ratio of Maue et al.:

$$\text{ratio} \sim \frac{\text{unblocked signal}}{\text{blocked signal}} = \frac{X}{0}, X > 0 = \infty$$

Note the ratio of claim 8:

$$\text{ratio} \sim 25\% = 1/4$$

The exemplary ratio of Maue et al. ( $\infty$ ) is higher than the predetermined value (25%) of claim 8.

**Regarding claim 9,** Maue et al. discloses:

The optical signal transmission device according to claim 6, wherein the optical axis of the light-emitting element is set to be directed to between the first and second slanted reflection planes (i.e. the central axis of transmitter 1A facing a windshield in Fig. 5 in the case that an unblocked signal is on one side of the axis and a blocked signal is on the other side of the axis).



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**Regarding claim 10**, Maue et al. discloses:

The optical signal transmission device according to claim 6, wherein said reflector is formed with a curved reflection plane (i.e. a windshield in Fig. 5).

**Ieda et al.**

8. **Claims 1-9** are rejected under 35 U.S.C. 102(b) as being anticipated by Ieda et al. (JP 05-344069 A).

**Regarding claim 1**, Ieda et al. discloses:

An optical signal transmission device, mounted to a vehicle, for propagating an optical signal, used to control operation of a vehicle-mounted apparatus, through a free space along a first propagation path (blocked path from optical transmitting unit 11 to optical receiving unit 13 in Drawing 1) extending from an emitter to a receiver and a second propagation path (unblocked path from optical transmitting unit 11 to optical receiving unit 13 in Drawing 1) extending from the emitter to the receiver via a reflector (wall surface 20 in Drawing 1 or reflecting plate 23 in Drawing 5) that is disposed outside the emitter and the receiver, the improvement comprising:

an optical axis of a light-emitting element of the emitter or that of a light-receiving element of the receiver being deviated (axes of light emitting devices 12 in Drawings) such that a ratio of an incident intensity, at the receiver, of a second optical signal propagating along the second propagation path (path of unblocked signal) to an incident intensity, at the receiver, of a first optical signal propagating along the first propagation path (path of blocked signal) is equal to or higher than a predetermined value (i.e. zero) at or above which a faulty optical-signal transmission is not caused.

Note that the following recitations have not been given patentable weight because they occur in the preamble:

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“mounted to a vehicle”

“used to control operation of a vehicle-mounted apparatus”

A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

**Regarding claim 2**, Ieda et al. discloses:

The optical signal transmission device according to claim 1, wherein at least one of the light-emitting element of the emitter and the light-receiving element of the receiver is disposed upward (Drawing 2).

**Regarding claim 3**, Ieda et al. discloses:

The optical signal transmission device according to claim 1, wherein said predetermined value is 25%.

Note an exemplary ratio of Ieda et al.:

$$\text{ratio} \sim \frac{\text{unblocked signal}}{\text{blocked signal}} = \frac{X}{0}, X > 0 = \infty$$

Note the ratio of claim 3:

$$\text{ratio} \sim 25\% = 1/4$$

The exemplary ratio of Ieda et al. ( $\infty$ ) is higher than the predetermined value (25%) of claim 3.

**Regarding claim 4**, Ieda et al. discloses:

The optical signal transmission device according to claim 1, wherein said light-emitting element is disposed that its optical axis (i.e. the axes of various light emitting devices 12 in

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Drawings 4-5) coincides with an upstream section, extending from the emitter to the reflector, of the second propagation path (path of unblocked signal).

**Regarding claim 5,** Ieda et al. discloses:

The optical signal transmission device according to claim 1, wherein one or more reflector members (wall surface 20 in Drawing 1 or reflecting plate 23 in Drawing 5) are disposed in either or both of upstream sections, extending in the emitter, of the first and second propagation paths.

**Regarding claim 6,** Ieda et al. discloses:

An optical signal transmission device, mounted on a vehicle, for propagating an optical signal, used to control operation of a vehicle-mounted apparatus, through a free space from an emitter to a receiver, the improvement comprising:

said transmission device (Drawings 1-9) having a reflector (various wall surfaces in Drawing 1 or reflecting plate 23 in Drawing 5) disposed outside the emitter (optical transmitting unit 11 in Drawings) and the receiver (optical receiving unit 13 in Drawings) and formed with first and second slanted reflection planes (i.e. one wall surface 20 in Drawing 1 and the opposite wall surface that is not shown, note that optical transmitting unit 11 in Drawings 4 and 6 directs light to the left and to the right of unit 11); and

said emitter including a light-emitting element (light emitting device 12 facing the left or right of unit 11 in Drawing 4) having an optical axis thereof deviating from an imaginary line (line-of-sight between an emitter-and-receiver pair) connecting the emitter and the receiver toward the reflector such that a ratio between incident intensities of first (i.e. an unblocked reflected signal) and second (i.e. a blocked reflected signal) optical signals, emitted from the emitter, reflected individually by the first and second slanted reflection planes and then entering the receiver, is equal to or higher than a predetermined value (i.e. zero) at or above which a faulty optical signal transmission is not caused.

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Note that the following recitations have not been given patentable weight because they occur in the preamble:

“mounted on a vehicle”

“used to control operation of a vehicle-mounted apparatus”

A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

**Regarding claim 7**, Ieda et al. discloses:

The optical signal transmission device according to claim 6, wherein said receiver includes a light-receiving element (photodetector 14 in Drawing 2, photodetectors 34-36 in Drawing 7, photodetectors 44-46 in Drawing 8, photodetectors 64-66 in Drawing 9) for receiving the first and second optical signals, and at least one of the light-emitting element of the emitter and the light-receiving element of the receiver is disposed upward (Drawing 2).

**Regarding claim 8**, Ieda et al. discloses:

The optical signal transmission device according to claim 6, wherein said predetermined value is 25%.

Note an exemplary ratio of Ieda et al.:

$$\text{ratio} \sim \frac{\text{unblocked signal}}{\text{blocked signal}} = \frac{X}{0}, X > 0 = \infty$$

Note the ratio of claim 8:

$$\text{ratio} \sim 25\% = 1/4$$

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The exemplary ratio of Ieda et al. ( $\infty$ ) is higher than the predetermined value (25%) of claim 8.

**Regarding claim 9**, Ieda et al. discloses:

The optical signal transmission device according to claim 6, wherein the optical axis of the light-emitting element is set to be directed to between the first and second slanted reflection planes (i.e. the axis of either light emitting device 12 in Drawing 4 that faces to the left or to the right of unit 11).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ieda et al. in view of Rogers.

**Regarding claim 10**, Ieda et al. does not expressly disclose:

The optical signal transmission device according to claim 6, wherein said reflector is formed with a *curved* reflection plane.

However, reflection planes of myriad shapes are known in the art. Rogers teaches one exemplary shape of a curved reflection plane (Rogers, ellipsoid reflector 21 in Fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to form the reflector of Ieda et al. with a curved reflection plane, like that of Rogers. One of ordinary skill in the art would have been motivated to do this since curved reflection planes can have special geometric properties that provide some benefits to the optical transmission device of Ieda et al.. For example, the ellipsoid shape of the curved reflection plane of Rogers automatically directs incident signals from one focal point to another focal point (Rogers, signal paths of 61 and 62 from F1 to F2, col. 3, l. 40-43) and makes the length of all paths from one focal point to the other focal point to be the same, independent of the incident location of a reflected path (Rogers, col. 3, l. 44-47). These properties enable a more focused transmission signal and reduce concerns for worst-case timing and phase shift considerations (Rogers, col. 4, l. 41-44).

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rossi is cited to show a free-space optical signal transmission device that employs multiple propagation paths and reflectors/reflection planes in those paths. Takamatsu is cited to show a free-space optical signal transmission device that employs means for variably controlling the direction of optical signals along multiple propagation paths. Burns et al., Kurata et al. '544, Kurata et al. '545, and Kurata et al. '518 are cited to show free-space optical signal transmission devices that employ multiple propagation paths and reflectors/reflection planes in those paths to enable communications without line-of-sight paths.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 703-305-6457. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DSK



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